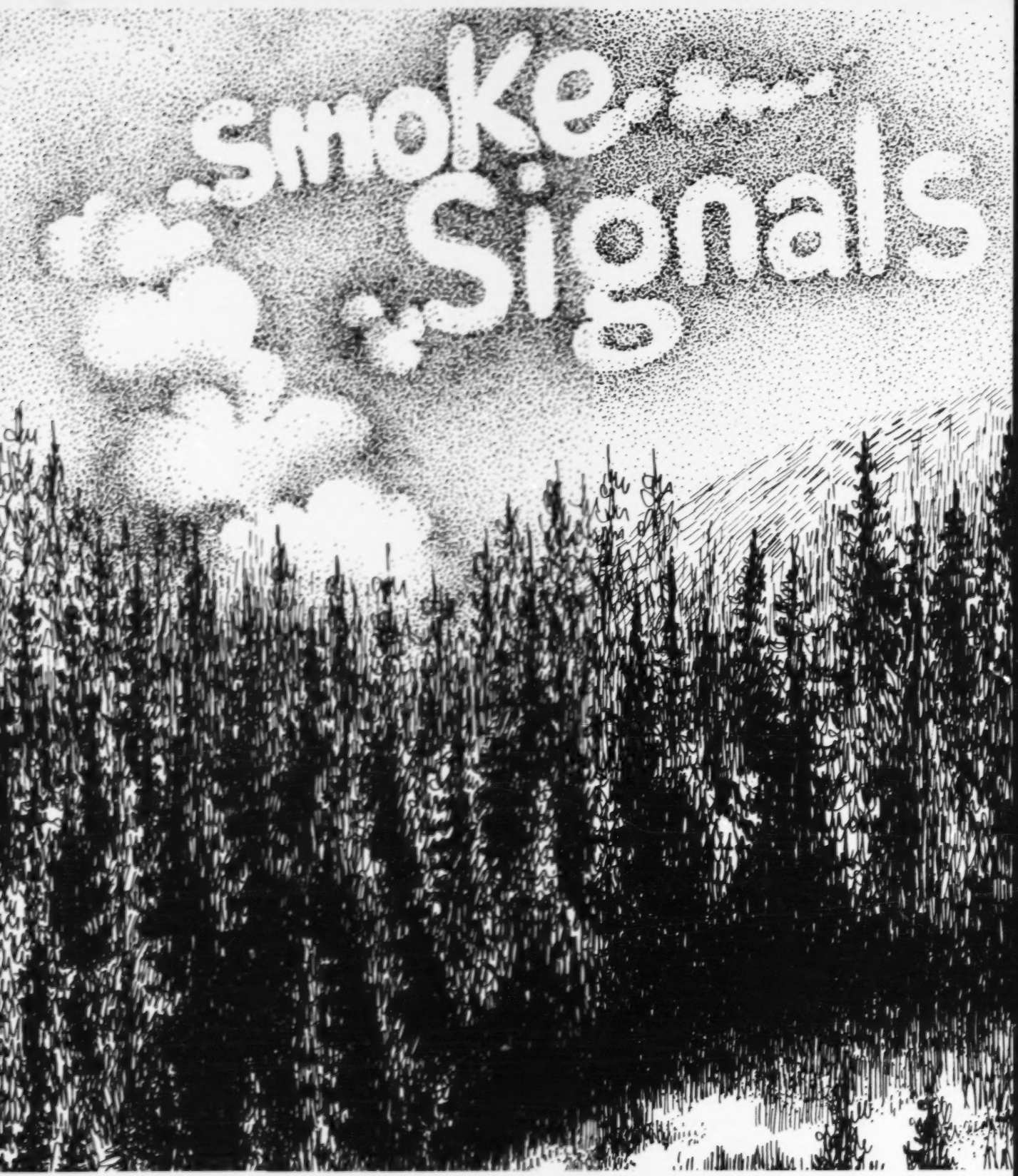
smoke signals



National Research Council Canada
Conseil national de recherches Canada

Canadian Committee on Forest Fire Management
Comité canadien de gestion des feux de forêts

Canada

NATIONAL RESEARCH COUNCIL
CANADIAN COMMITTEE ON FOREST FIRE MANAGEMENT

S M O K E S I G N A L S

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ACKNOWLEDGMENTS

The Subcommittee wishes to thank Henrik Bent Axel Andersen for his interest and effort in preparing and organizing this issue of Smoke Signals. Henrik offered to produce this issue for the purpose of gaining practical experience in technology transfer and technical writing. Graduating in 1980 from the University of Guelph with an Honours Bachelor of Science degree in Biology, he now wishes to pursue a career in technical writing and editing. Henrik is presently searching for a position in forestry in the field of communications and technology transfer.

The members thank Gerald Davis for his significant contribution toward the establishment and ongoing success of the Forest Fire Equipment Subcommittee. Gerald has recently retired as Supervisor, Forest Protection (Fire), Nova Scotia Department of Lands and Forests.

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CANADIAN COMMITTEE ON FOREST FIRE MANAGEMENT

S M O K E S I G N A L S

Number Three

January 1987

The National Research Council's, Canadian Committee on Forest Fire Management, Forest Fire Equipment Subcommittee periodically publishes Smoke Signals. Smoke Signals introduces valuable forest fire suppression management, equipment and products to forestry personnel and increases communications among the Canadian forest fire management agencies. The success of Smoke Signals is determined by the fire management information that is contributed by the Equipment Subcommittee members, fire management agencies/research organizations and equipment/product manufacturers. The product, trade, or firm names in this Newsletter are incidental to noncommercial information. The Newsletter Committee remains impartial to product, trade, or firm names. Additional information is available from the Equipment Subcommittee members, fire management agencies, and product manufacturers that are listed at the conclusion of this Newsletter. Smoke Signals is published in the French language under the title "Signaux de Fumée."

CCFFM Forest Fire Equipment Subcommittee (Peter Wall)

Equipment and Product Demonstrations at the Newfoundland Forest Protection Centre

The Forest Fire Equipment Subcommittee met in Newfoundland, October 1-4, 1986. The meeting provided Subcommittee members and members of the NWCG, Fire Equipment Working Team (Brian Hutchins and Paul Hill) an opportunity to observe first hand the operation of the recently completed Forests Resources and Lands, Forest Protection Centre in Gander. Also an eventful tour of Terra Nova National Park was well appreciated by the participants. Other highlights of the meeting included: (a) the establishment of a liaison between the NWCG, Fire Equipment Working Team and the Forest Fire Equipment Subcommittee, (b) the development of national specifications for several pieces of fireline equipment, (c) the recommendation to establish a joint United States/Canada fire fighting foam specification, (d) the recommendation to pursue the development of an airborne laser ignition system, (e) the demonstration of a variety of new fire suppression equipment and products. Thank you very much Ed Blackmore, Tom Molloy, Dick Carroll, Jim Reynolds, Fred Wallace, Phil Hammond and many others who made our visit to Newfoundland so memorable.

CCFFM Equipment Workshop

The CCFFM Equipment Workshop was hosted by the Ontario Ministry of Natural Resources at the OMNR Thunder Bay Service Centre, September 24-27, 1984. The theme included the principle functions undertaken at the Thunder Bay Service Centre, and equipment processing and management. The workshop was attended by members of the provincial and territorial forest fire management agencies, Canadian Forestry Service, Canadian Interagency Forest Fire Centre, forest industries, and Oregon State Forestry Department.

AGAtronics Limited, Angus Fire Armour Limited, B.D. Wait Company Limited, Design Fabrication, Dominion-Pegasus, Fireflex Manufacturing Limited, Fleck Brothers Limited, Forest Technology Systems Limited, Honda Canada Incorporated, Langridge-Marshall, L.C. FAB Industries Limited, National Fire Hose (of Canada) Corporation, Okanagan Helicopters Limited, Premo Plastics Engineering Limited, Rema Tip Top Rubber, Safety Supply Canada, SEI Industries Limited, Simplex Manufacturing Company, Wajax Manufacturing Limited, Weatherhaven Resources Limited, Western Fire Equipment Company, and Wilson and Cousins Limited exhibited and demonstrated their equipment at the workshop.

The forest fire equipment subcommittee will develop national equipment and product standards, initiate a system to alert agencies and industry of equipment and product deficiencies, and assist in the development of new equipment and products.

Economical Fire Camp Wood Stove

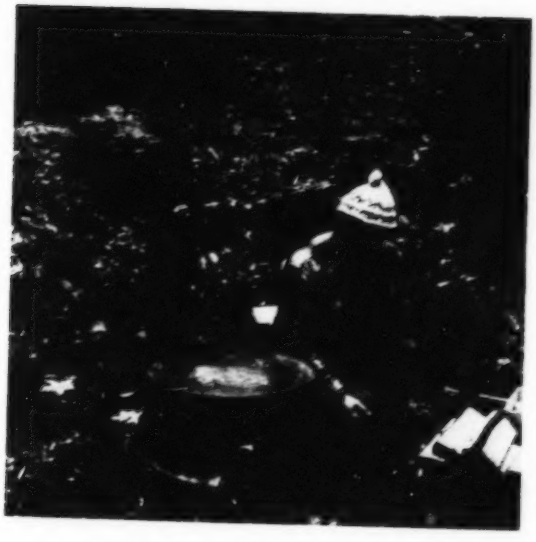
This fire camp wood stove replaces the two-hole and four-hole collapsible sheet metal wood stove. A standard 205-L fuel drum is cut into two halves. One-half of the fuel drum serves as the stove while the other half acts as the oven. The stove portion has a 30.5 x 30.5 cm opening for burning wood and a 15.2-cm diameter hole for a stove pipe with a damper. The oven portion has a 30.5 x 30.5 cm opening for food and is placed on the stove portion. This wood stove is serviceable for 18 days. Contact the British Columbia Ministry of Forests for further information.

Redesigned Wheeled Skidder Firefighting Tank

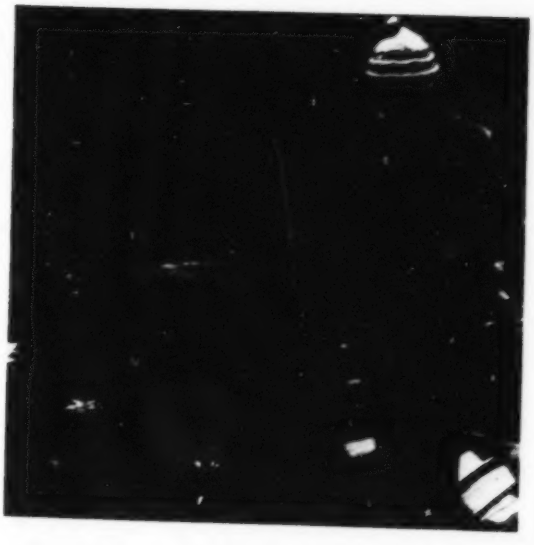
The wheeled skidder firefighting tank was redesigned by the British Columbia Ministry of Forests to remain compatible with present skidder designs. The front of the unit was modified and the bumper plates were extended, strengthened, and tied together. The rear lifting ring was attached to a 1600-cm length of large diameter pipe. The channel used in the frame was boxed in and the tank adjustment slots were deleted. The hookup was simplified and the pump was moved to the rear of the unit. The base frame is 188 x 78.8 cm. Each unit is supplied with a low volume, low pressure Monarch pump. The water storage tank has a 1363-L capacity. For additional information contact the British Columbia Ministry of Forests.

CCFFM Equipment Workshop

CCFFM Equipment Workshop

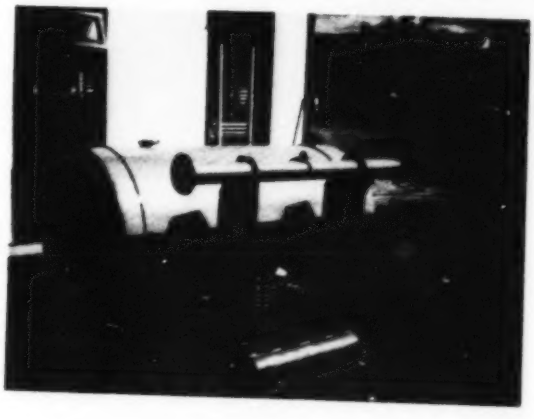


Economical Fire Camp Wood Stove



Economical Fire Camp Wood Stove

Redesigned Wheeled Skidder
Firefighting Tank



Redesigned Wheeled Skidder
Firefighting Tank

Wajax Mk.75 Pump Kit and Box

The Wajax Mk.75 pump is used extensively in large fire operations. The Alberta Forest Service kitted and boxed the Wajax Mk.75 pump for helicopter sling operations. A four-legged sling attaches to the eye bolt and helicopter lanyard. Willy Dubbledam provides plans of the Wajax Mk.75 pump kit and box upon request.

Wajax Pump Primer Bulb

The Lac La Biche Forest, Alberta Forest Service installed a primer bulb to the gas line assembly of the Wajax Mk.75 and Wajax Mk.3 pumps. The bulb improves gas priming and consequently the starting process of these pumps.

Wajax Mk.75 Fine Meshed Screen

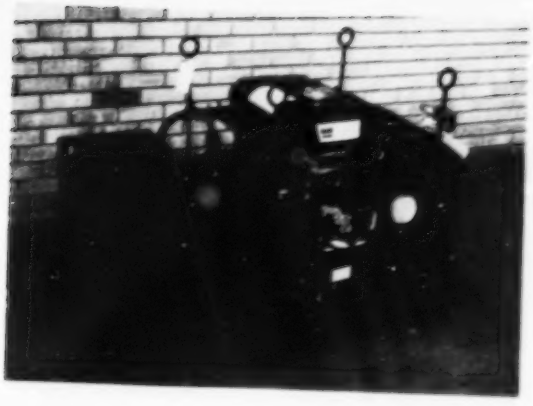
The Lac La Biche Forest, Alberta Forest Service fitted a fine meshed screen over the air intake of the Wajax Mk.75 pump. The fine meshed screen prevents debris and fluff from entering the cooling system and improves the performance of the Wajax Mk.75 pump. A removable clamp secures the screen over the air intake.

Portable Fire Grate

The Alberta Forest Service developed a portable fire grate. The grate is used on open fires. Cooking pots and pans are easily handled when the portable fire grate is used.

Alberta Forest Service (AFS) Portable Fueling Systems

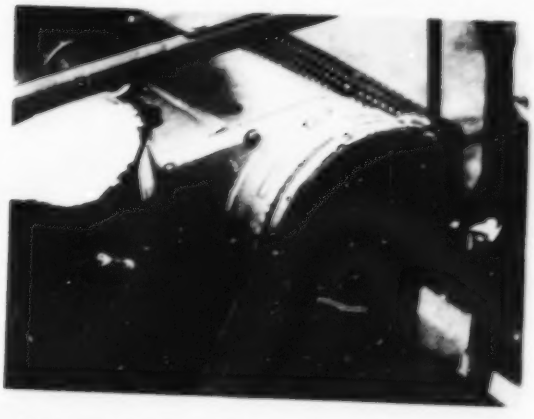
The AFS portable fueling systems provide an economical storage and dispensing method for aviation fuels, primarily Jet B fuels. The fueling systems include fuel bladders, seal drums, and AFS fuel pumpers. The size and weight of fuel bladders range from 6800 to 22 500 L and from 46 to 82 kg, respectively. They are constructed of a single ply nylon-coated with polyurethane. The fuel bladder inlet/outlet fittings were adjusted to accommodate the AFS fuel pumper and standard commercial fuel tankers. An empty rubber seal drum weighs 125 kg and has a 940-L capacity. They are used to transport aviation fuel inside aircraft or to store aviation fuel at remote airstrips. There are yellow and blue AFS fuel pumpers. The yellow fueler is a centrifugal pump and the blue fueler is a positive displacement pump. The fuel pumpers weigh 130 kg. All fuels are double filtered with the AFS portable fueling systems.



Wajax Mk.75 Pump Kit and Box

Wajax Mk.75 Pump Kit and Box

Wajax Pump Primer Bulb



Wajax Mk.75 Fine Meshed Screen

Portable Fire Grate

AFS Portable Fueling Systems

Hose Rehabilitation

The Manitoba Department of Natural Resources, Fire Management and Communications group initiated a hose rehabilitation program to decrease hose replacement costs. Three hose recycling depots were established at Wekusko Falls, Paint Lake, and Pine Falls. During 1985, the Paint Lake hose depot saved 568 hose lengths and about $33 300.00. The Paint Lake facility includes a 4.9 x 7.3 m hose patching and repair building, a 6.1 x 18.3 m hose rolling and storage building, a hose drying building with two electrical furnaces, two hose testing and drying racks, and a pump house with a 10-horsepower, three-phase electrical pump motor. For further information contact Bob Buck.

Mobile Fire Equipment Trailers

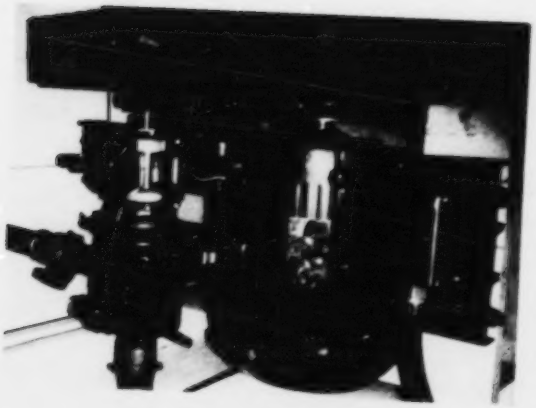
The Manitoba Department of Natural Resources, Fire Management and Communications group initiated a mobile fire equipment trailer program to enhance the suppression impact on wildfires. Six used trailers were purchased, repainted, and refurbished in preparation for the 1986 fire season. The messages "Fire Management Mobile Fire Warehouse" and "Prevent Forest Fires Use Your Ash Tray" were painted on the sides and rear of these trailers, respectively. These trailers are stationed at The Pas, Thompson, Swan River, Gimli, Lac Du Bonnet, and Hadashville. The price of each renovated trailer was about $9000.00. An Ontario mobile fire warehouse trailer was developed by the Ministry of Natural Resources, Timmins District, Northern Region.

Modified Wajax C-2729 Hose Washer

Bob Burke, OMNR modified the Wajax C-2729 hose washer. This modification eliminates problems with removing debris from a clogged washer. A hole slightly smaller than 13 mm is drilled into the washer and a short, 13-mm outside diameter bolt is turned in and out of the washer. The bolt is removed when the hose washer is cleaned. All debris is flushed from the washer in about five minutes.

DFC Hose Strangler Holster

Donald F. Cochrane, Stonecliffe Work Centre, Pembroke District, OMNR designed a rugged and durable hose strangler holster. This is a unique and useful holster design. The holster requires heavy gauge wire or a planting assessment pin. One assessment pin provides material for two holsters and costs $0.05 each. Assessment pins are purchased from Canadian Forestry Equipment Limited. This new holster design will not mildew or tear and is faster to use than conventional holsters.

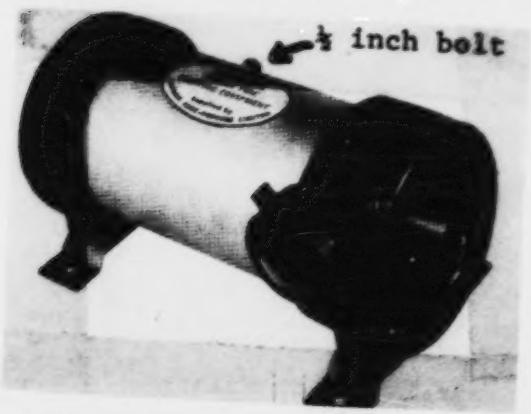


Hose Rehabilitation

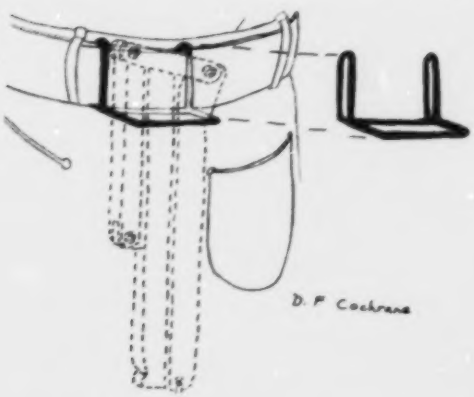
Hose Rehabilitation

Mobile Fire Equipment Trailers

Mobile Fire Equipment Trailers



Modified Wajax C-2729 Hose Washer



DFC Hose Strangler Holster

Fire Control Notebook

The fire control notebook provides a field guide of the duties and responsibilities of various positions within the OMNR fire control organization. This pocket-sized notebook contains colour-coded sections to help locate different duties. These sections are command (pink), suppression (blue), service and support (green), additional information (white), and fire investigation (mauve). The pages are numbered to facilitate revisions and additions. Additional fire control notebooks are available from the Aviation and Fire Management Centre.

Base Camp Rotisserie Barbecue

The base camp rotisserie barbecue was designed by the Geraldton District, OMNR. The rotisserie can feed a large number of people quickly and efficiently. Cooking staff prepare a wide variety of foods in a short time using the rotisserie. This unit is lifted by four men and costs about $2500.00. The cost is reduced by using old fire tower materials and other scrap metal. A skilled welder with a working knowledge of small engines and gear reduction devices can build a rotisserie barbecue in about five days. A detailed description of the base camp rotisserie barbecue can be obtained from the Aviation and Fire Management Centre.

Hose Repair Table

A hose repair table was constructed at the Thunder Bay Service Centre, OMNR. Damaged hose lengths are folded and placed in plastic tubs below the repair table. A wall mounted minihose drier above the repair table dries about 24 sections of wet hose in 1.5 hours. Dried hose sections are placed on the repair table and patched using the REMA TIP-TOP cold patch technique. The table top locks the hose sections into place. The failure rate of this patching technique is less than two percent. Contact the Aviation and Fire Management Centre for a detailed description of the hose repair table.

Pump Racks for Wajax Fire Pumps

The Timmins District, OMNR developed a durable, one piece pump rack. A 13-mm aluminum conduit pipe (193-cm long) is formed into an oblong shape using a wooden pump frame jig and its ends are welded together. A hydraulic press curls the ends of the frame into a regular pump rack shape. These homemade racks cost $5.20 each.

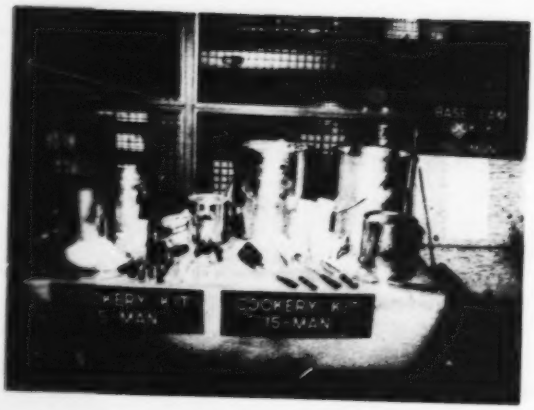
Forest Fire Hazard Sign

A new forest fire hazard sign was designed by the Dryden District, OMNR. Graphics and colour are used to create bright and highly visible signs. The message board is the major feature of the sign and can be changed throughout the season. Message boards such as "Anglers Ensure Your Campfire Is Out," "Hunters Ensure Your Campfire Is Out," and "Please Help Us Keep Ontario Green" all have a green background with white letters. The "Restricted Fire Zone-In Effect" message board shown in the illustration has an orange background with black letters. Contact the OMNR for additional information.

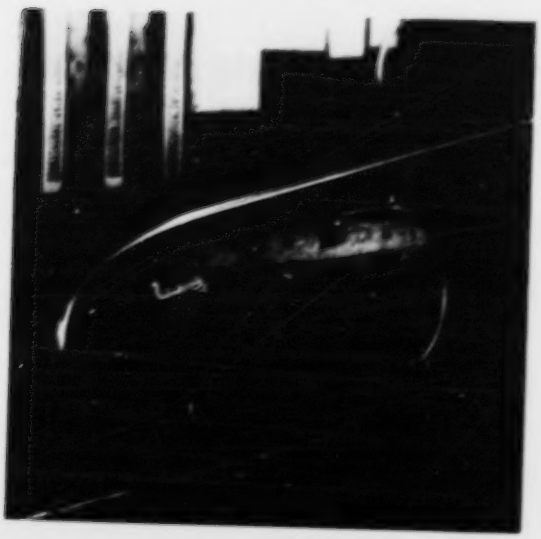
Fire Control Notebook

Ontario

Fire Control Notebook



Base Camp Rotisserie Barbecue



Pump Racks for Wajax Fire Pumps

Forest Fire Hazard Sign

Hose Repair Table

Hose Repair Table

Hose Strangler Modification

The Société de Conservation de l'Outaouais modified the Wajax hose strangler to prevent leg and arm injuries caused by slippage. Some hose stranglers slip while used with synthetic hose when installed near the pump because their arms did not produce enough squeeze pressure on the hose. Defective stranglers were modified by adding a welding bead in the notch of the vice arm and offsetting the hole at the other end to accept a larger pin, thus bringing te two arm close together. The Société de Conservation de la Gaspésie originally modified the Wajax hose strangler to reduce hose damage (Smoke Signals, Number One, April 1983).

Ice Box

The Société de Conservation de l'Outaouais designed an ice box for field operations. The 76.2 x 40.6 x 30.5 cm ice box requires two cardboard boxes and styrofoam sheets. A 25-mm styrofoam sheet is inserted between the walls of two cardboard boxes. A 19-mm styrofoam sheet insulates the top and bottom of the ice box.

205-L Drum Lifting Lever

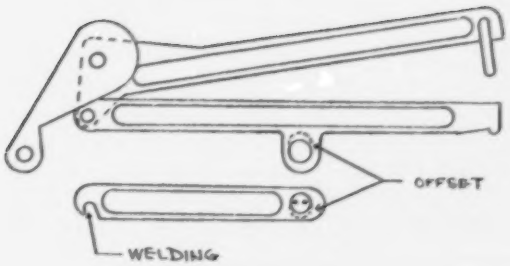
The Société de Conservation de l'Outaouais developed a lever for lifting 205-L fuel drums. A 0.5 x 7.6 x 15.2 cm metal plate with a rubber cushion and a rubber handle are attached to opposite ends of a 1.9 x 101.6 cm steel pipe. This lifting lever prevents nagging backaches.

Power Pump Seal Testing System

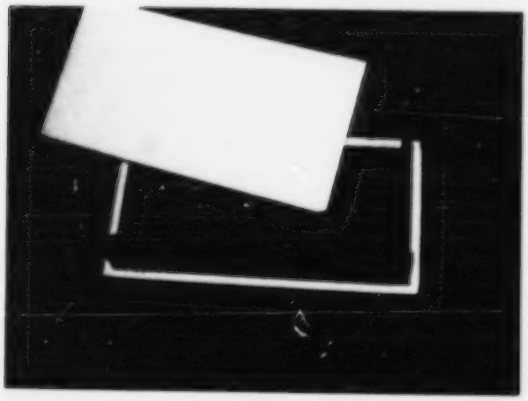
The Société de Conservation de l'Outaouais created a system for testing the seals of one cylinder motors. The airtightness of the seals is measured by blocking the carburetor to cylinder and the cylinder to exhaust openings with two metal covers, and measuring manually injected compressed air with a manometer. This system saves maintenance time because the motor is not dismantled during testing.

Nickel-Cadmium Battery Charger Modification

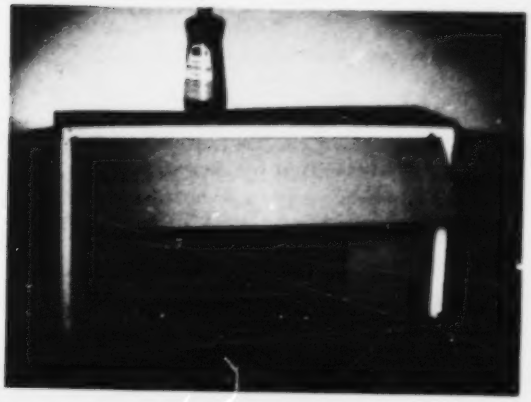
The Société de Conservation de l'Outaouais modified the circuit of the nickel-cadmium battery charger. The modified battery charger discharges the battery to a minimum safe voltage and then recharges the battery to a maximum voltage. This modification gives better service and longer life to nickel-cadmium batteries.



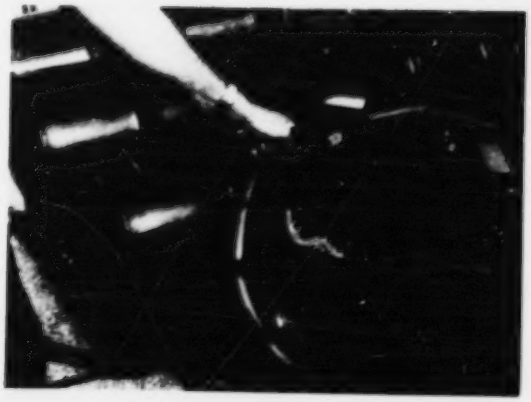
Hose Strangler Modification



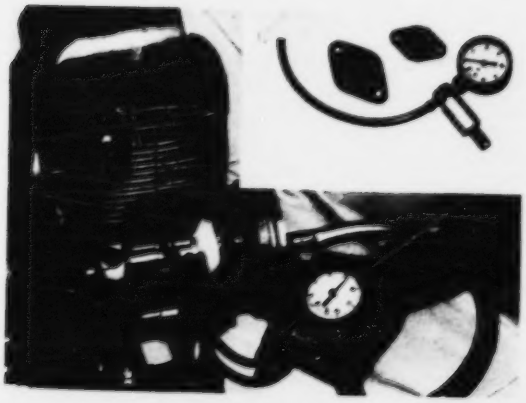
Ice Box



Ice Box



205-L Drum Lifting Lever



Power Pump Seal Testing System

Nickel-Cadmium Battery Charger
Modification

A Muskeg Forest Fire Tanker

The New Brunswick Department of Natural Resources developed a multi-functional vehicle to control wildfires and prescribed burns. The flatbed of the basic Bombardier Muskeg Carrier Diesel is fitted with a 2250-L, 10-gauge steel tank. Additional features include a Gorman-Rupp pump, two electrical booster hose reels, 2-25 x 6 mm Teejet front track spray nozzles, 1 x 18 mm plastic water level gauge, 7260-kg capacity rear winch, and a pintle hitch. Portable accessories and equipment such a Hughes Probeye infrared scanner kit, Wajax pump kit, chain saw kit, first aid kit, multichannel forest service radio, hand tools, hoses, nozzles, and hose stranglers are found on the forest fire tanker. It is transported on provincial roads by a three ton truck. The tanker travels over muskeg, swamps, bogs, shallow rivers, and streams. The vehicle pumps water from lines and nozzles while in motion, and hauls equipment during mop-up operations. The muskeg tanker is being considered for other forest management activities.

Fuel Containers (Gerry Cans)

The Nova Scotia Department of Lands and Forests fitted their gerry cans with shoulder straps. This is an extremely effective method to carry fuel containers in the field.

Fire Pump Boxes

The Nova Scotia Department of Lands and Forests ship and store their portable fire pumps in wooden boxes. These pump boxes have protected their pumps for over 30 years.

Fire Control Monitor

Bayly Engineering Limited manufactured a fire control monitor for the fire control headquarters, Shubenacadie, Nova Scotia. The fire control monitor is compatible with the provincial government radio system. The duty officer has monitor and interrupt capabilities on all Department of Lands and Forests repeaters.

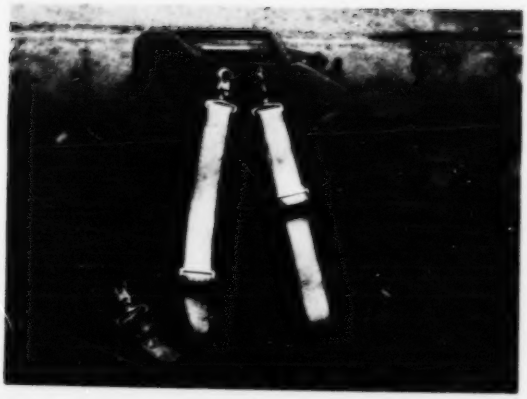
Bambi Bucket Suspension Cables

The Nova Scotia Department of Lands and Forests shortened the suspension cables of their Bambi Buckets to comply with safety regulations. During the 1984 fire season, the revised 455 and 3542-L Bambi Buckets were used safely with the Hughes 500D and Bell 212 helicopters, respectively. SEI Industries Limited manufactures bambi buckets with suspension cables designed for all helicopter models.

Hydroblender

The 38-mm in-line hydroblender is used during ground fire mop-up operations. A wet water agent is released from hydroblender capsules and mixed with water within the hydroblender. The Nova Scotia Department of Lands and Forests has successfully used the hydroblender for about 20 years.

A Muskeg Forest Fire Tanker

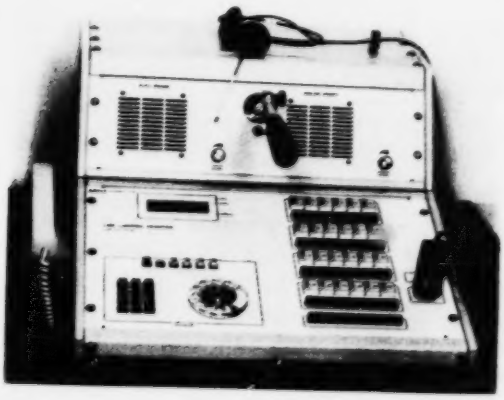


Fuel Containers (Gerry Cans)

Bambi Bucket Suspension Cables

Hydroblender

Fire Pump Boxes



Fire Control Monitor

ATC Trailer

The Prince Edward Island Department of Energy and Forestry designed an ATC log trailer. The trailer frame requires different lengths of 40-mm steel pipe. A 47-mm hitch, 2-6.7 x 15 tires, a 5 x 5 x 25 cm stub axle base, and a 3.8 x 15 cm stub axle are also needed. The trailer transports water and equipment to remote areas. The Silvicultural Development Section, Department of Energy and Forestry provides detailed drawings upon request.

Initial Attack Porta-Tank

Paul Butra, Whitehorse District, Yukon Forest Service fabricated a collapsible 80 x 122 x 35 cm porta-tank frame using two existing 4546-L porta-tanks. The frame is ferried in a Bell 206 B helicopter or medium lift rotor-wing. Conventional nuts and bolts secure the porta-tank frame parts together. The assembled porta-tank uses a 4546-L liner. Contact Dick Seaman for further information about the design of the initial attack porta-tank.

One Shot Fire Hose

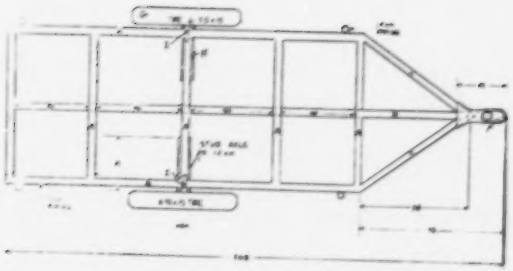
The One Shot fire hose was developed by Niedner Limited/Limitée. It was designed as an inexpensive, disposable hose to eliminate recovery and refurbishing costs. The one shot hose is available in 150-m lengths that can be cut at 30-m intervals for field attachable couplings. A special weave pattern or colour distinguishes the One Shot hose from other hoses. It can be packaged in hose pack containers. This hose has one-half of the abrasion level and the same percolating property as Niedner Fireline 3 percolating hose. During the 1986 fire season, field tests were conducted by several forest fire management agencies in Canada. Ideas for improving the one shot hose should be directed to Allan Jeffrey, CIFFC.

Days Gone By?

A picture or a story from the past is featured in each issue of Smoke Signals. Submitted by Klaus Barth, N.B. Dept. of Forest, Mines & Energy, this grinding wheel has sharpened hand tools since 1784. Today, this grinding wheel is manufactured in New Brunswick. The users of this grinding wheel state that it is "still the best means of keeping the cutting edges of hand tools in keen condition". Please submit any unusual pictures or stories for future issues of Smoke Signals.

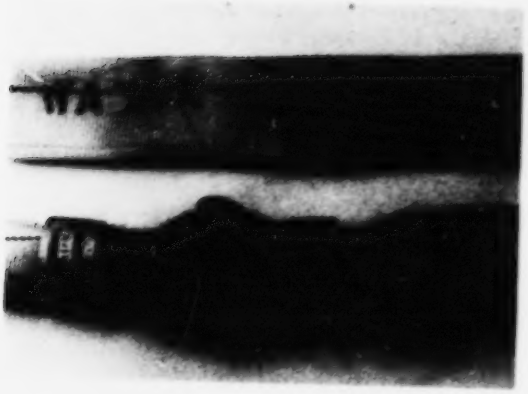
AGA Thermopoint 80

The Thermopoint 80 is a precision manual-scanning radiometer. This unit measures the temperature of mop-up sites. It gives digital readouts in both Celsius and Fahrenheit temperatures. It determines the average, maximum, minimum, and different temperature values of up to 10 000 points at different times or places. The Thermopoint 80 integrates both emissivity and ambient tempertures. It weighs about 1 kg and uses rechargeable or primary cell batteries. The Thermopoint 80 is sold by AGA Infrared Systems AB.

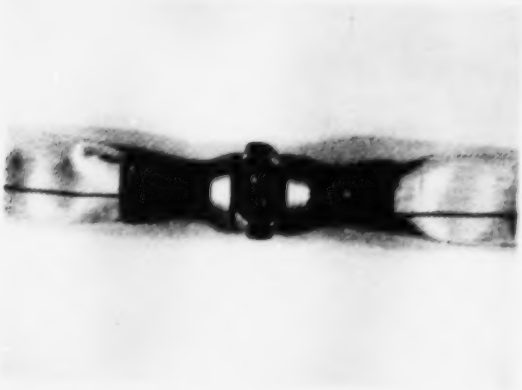


ATC Trailer

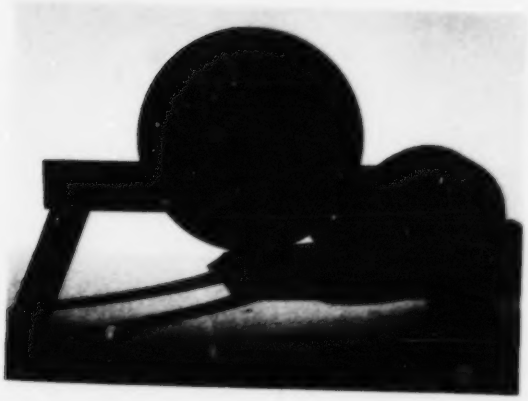
Initial Attack Porta-Tank



One Shot Fire Hose



One Shot Fire Hose



Days Gone By?

AGA Thermopoint 80

AGA Thermovision 782

The Thermovision 782 is a portable infrared temperature measurement system. It detects and measures the temperature of holdover fires. The Thermovision 782 includes an infrared, short wavelength scanner, and a black and white monitor. A videotape recorder and colour monitor enhance permanent recordings of the thermal image. The scanner requires liquid nitrogen for cooling. An assortment of lenses and filters optimize system performance. The superviewer superimposes the thermal image on the visual picture. The Thermovision 782 is manufactured by AGA Infrared Systems AB.

Elevated Sprinkler Design

Canadian Forest Products Limited developed an elevated sprinkler design to wet mop-up sites and fireguards. This design includes a 2-m riser to elevate a 3-mm orifice sprinkler head, a 5-m intermediate 16-mm hose from the main 38-mm hoselay to the sprinkler head, and a valve to regulate water flow. The sprinkler units (riser, sprinkler head, intermediate hose, valve) cost about $35.00 each. A Wajax Mk.3 firepump or gravity feed operates many sprinkler units. Sprinkler units that are spaced 16 m apart provide continuous wetting. Two people with an ATV establish a fireguard in a short time. Additional details are available from Oliver Thomae.

Fireline Workhorse, Suzuki 185 Lt Quadrunner

Canadian Forest Products Limited discovered that the Suzuki 185 Lt Quadrunner is invaluable for transporting firehose, sprinklers, pumps, and people on firelines, rough roads, and fireguards. Its durable and wide, low pressure tires travel in areas that are inaccessible to conventional vehicles. Two people easily load the Suzuki 185 onto a pickup truck. The Suzuki 185, with front and rear racks, costs about $2500.00. Contact Oliver Thomae for further details about the Suzuki 185 Lt Quadrunner.

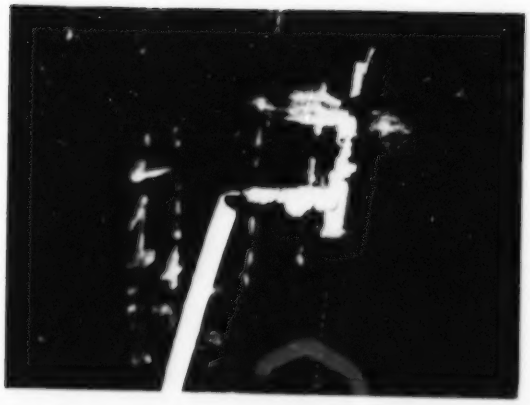
Versa-Ramp

This lightweight, flexible versa-ramp is used to load and unload small ATVs and materials. The ramp attaches to any tailgate surface and handles maximum loads of 395 kg. It is detached by removing two pins and folded into the rear-end of the truck box. It is available for $360.00 US. Contact the Coast Crane Body and Equipment Company for additional information. (The Innovator, December 1985)

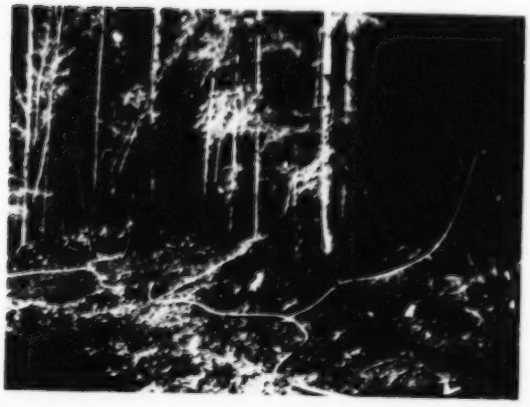
Can Opener

This unique, compact can opener is carried in a personal pack or pocket during field operations. An easy back and forth motion opens a can of supplies. It consists of hardened carbon steel and plated nickel. The cutting edge remains sharp for years. This can opener costs about $0.50 each. It is purchased from Coghlan's Limited.

AGA Thermovision 782

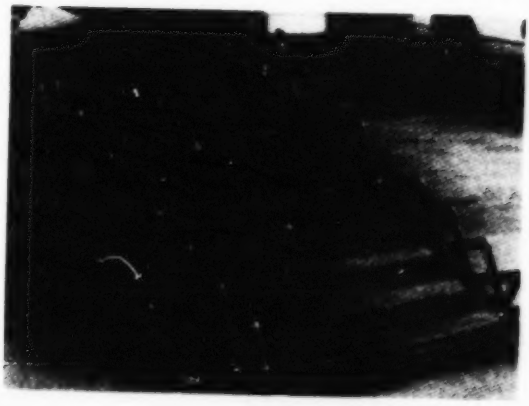


Elevated Sprinkler Design

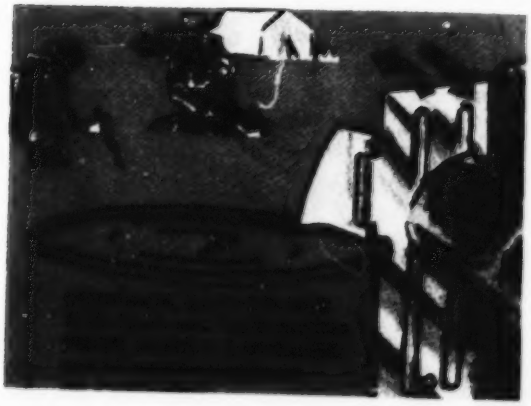


Elevated Sprinkler Design

Fireline Workhorse, Suzuki 185
Lt Quadrunner



Versa-Ramp



Can Opener

Ductape Adhesive

Ductape is a waterproof, heavy cloth-coated adhesive. It protects the cutting edges of hand tools such as axes, fire shovels, suede saws, and fire rakes. The hand tool cutting edge is completely covered and overlapped with about 6.5 mm of ductape. The ductape is sealed at the sides of the hand tool. It is used as an alternative to thermo or tool dip and is readily available from automotive or hardwood supply stores. It is inexpensive, safe, and easily handled. The OMNR uses ductape adhesive to protect their hand tools. Dundas-Jafine Industries Limited manufactures ductape adhesive.

Rap-A-Tent

The Rap-A-Tent is constructed of fire resistant material. The tent shown in the picture is 2.9 x 2.7 x 2.1 m and weighs about 10 kg. Other features include double doors, flow-through ventilation, integral floor, six-point tie down, optional porch/vestibule, and noseeum-netted windows at each end with interior/exterior flaps. For additional information contact Fireflex Manufacturing Limited.

Flex-Pak Backtank

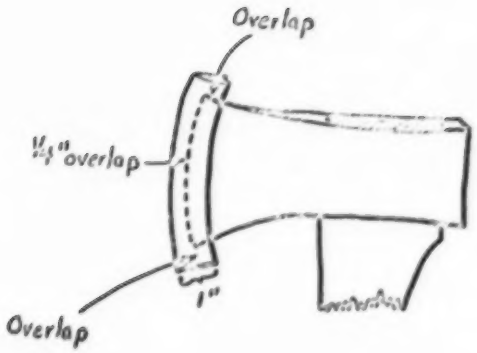
The Flex-Pak backtank was designed by Fireflex Manufacturing Limited with technical assistance from many North American and Australian fire fighters. It includes a collapsible, tubular, light (1.8 kg) tank, a three-way adjustable harness, an insulated kidney belt, and a flapper-valve designed pump. The tank has a 19-L capacity and a 10-cm filler inlet with a screen and screw cap. The high-impact plastic exterior of the pump surrounds a brass cylinder. The Flex-Pak backtank is designed for maximum ventilation and is used by helicopter initial attack crews.

Self-Supporting Collapsible Water Tanks

These tanks consist of a tough, puncture resistant PVC-coated polyester material. The 4546 and 6819-L tanks have a 7.6-cm discharge outlet. The 11 365-L tank has a 10.2-cm discharge outlet. These tanks store water with ground retardants, wetting agents, and foams for general use on fires. These tanks are refilled by a pump or by a helicopter using either a bucket or 1365-L belly tank (helitank) and Bell 205 helicopter . These collapsible water tanks are used by the British Columbia Ministry of Forests. Contact Fireflex Manufacturing Limited for additional information.

Quonset-Shaped Tent

The lightweight Quonset-shaped tent is easy to assemble. The 2.7 x 3.1 m Quonset-shaped tent weighs about 5 kg and is waterproof and fire resistant. The floors are built-in and easily replaceable. Collapsible, lightweight cords support the shelter entrance and storage vestibule. A second tent is added to the opposite end of the storage vestibule. Tents are identified by an external clear I.D. pocket. For further information contact Fireflex Manufacturing Limited.

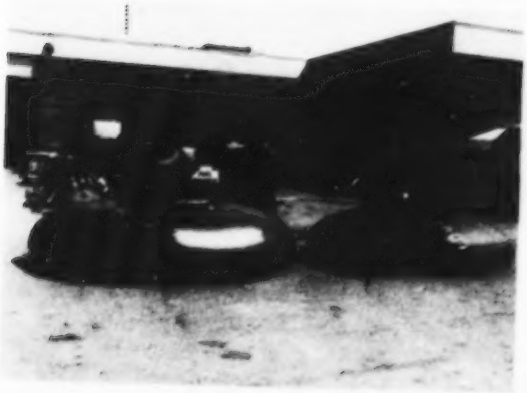


Ductape Adhesive

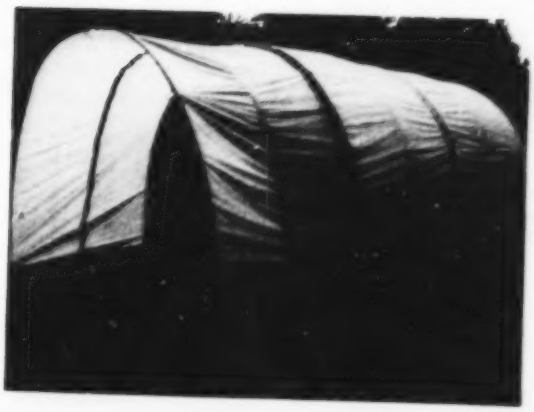
Rap-A-Tent

Flex-Pak Backtank

Flex-Pak Backtank



Self-Supporting Collapsible
Water Tanks



Quonset-Shaped Tent

DAID Match

The Tasmanian Forestry Commission reported that Australia has developed many different remote ignition systems. The original projectile was a 17.7-cm DAID match. The DAID match which is basically a length of safety fuse of which each end is dipped in match head material. It is ignited and thrown down inaccessible banks, tied to a blivet and tossed like a grenade or dropped from helicopters. The DAID match is no longer used as an aerial ignition device because of safety considerations.

Fireball Cartridge

The Forestry Commission of Tasmania described the latest refinement of the DAID match. This refinement uses a 12-gauge shot gun, Fireball cartridge. The cartridge is basially the head end of a DAID match and is fired from a 12-gauge shot gun. These incendiary cartridges are manufactured by the Munitions Filling Factory in NSW.

Electrical Ignition Device

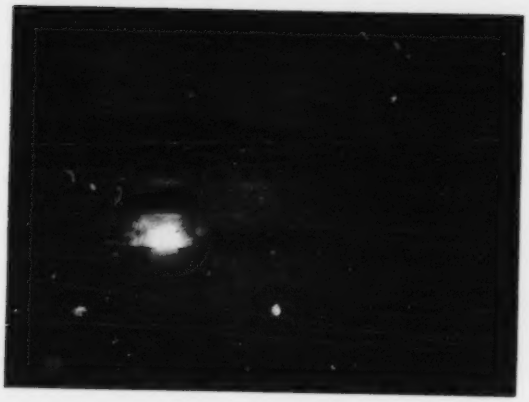
The Forestry Commission of Tasmania experimented with different electrical ignition devices. Initially, they used electrical fuse heads inserted into plastic bags with black blasting powder and then solid paraffin fuel blocks. Later, the fairly crude and dangerous blivet that is a sausage-shaped container with a gelled-dieseline mixture (Geletrol) was developed. Now, the Munitions Filling Factory in NSW has developed a compact electrical ignition device.

Flexible House

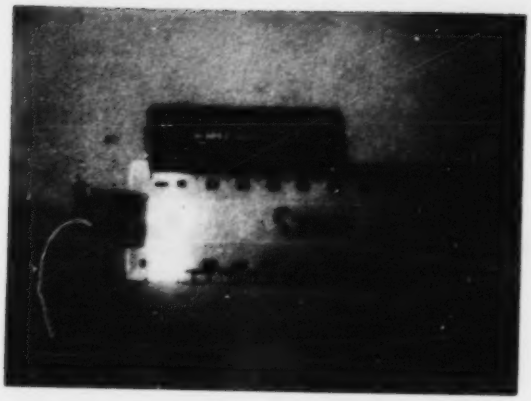
This 850 kg flexible house is constructed of aluminum and PVC foam. The folded, 6 x 2.4 x 0.5 m flexible house is transported by truck, helicopter, or crane to remote areas. Low air pressure from truck exhaust, hand pumps, or air cylinders inflates two small balloons inside the house. It is quickly erected by six men. The erected, 6 x 2.4 x 2.3 m flexible house provides shelter in cold climates. The roof, floor, and four walls are insulated. These portable housing units cost about $20,000.00. Contact Leesnurm Engineering for further information.

Headset Communication System

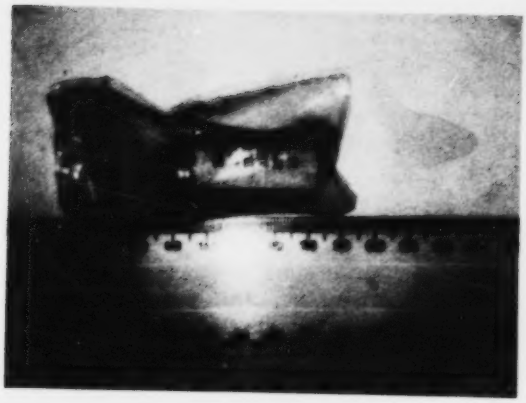
Levitt Safety Limited developed a headset communication system. This system includes a headset with earmuffs, a portable vox, and a throat microphone. The headset interfaces with the external outlet of any hand portable or mobile radio. The earmuffs reduce surrounding noise levels. The portable vox (voice operating transmission) with a noise compensating microphone is used in ambient noise areas up to 125 decibels. The throat microphone is used in noise areas above 125 decibels.



DAID Match

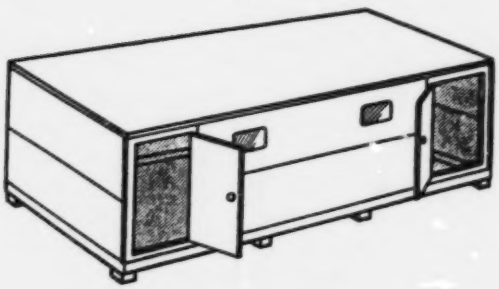


Fire Ball Cartridge



Electrical Ignition Device

Electrical Ignition Device



Flexible House

Headset Communication System

Abrasion Machine

Niedner Limited/Limitée manufactures linen and synthetic fire hoses. The resistance of various hose materials is tested and compared using a Factory Mutual type abrasion machine. A pneumatic cylinder drives a fixed, coarse-grit grindstone back and forth along the hose. A counter records the number of cycles that is required to rupture the hose. An abrasion machine and construction specifications can be obtained from David Lord.

Spare Tire Carrier

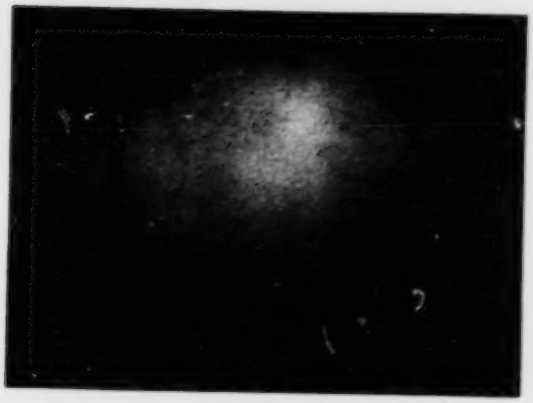
A spare tire carrier for large engines was developed by the Oregon State Forestry Department, Klamath-Lake District. The carrier uses a cable ratchet system. A spare tire is safely handled by one person during emergencies. Contact Dale Walker for additional information about the spare tire carrier. (The Innovator, December 1985)

The Airborne

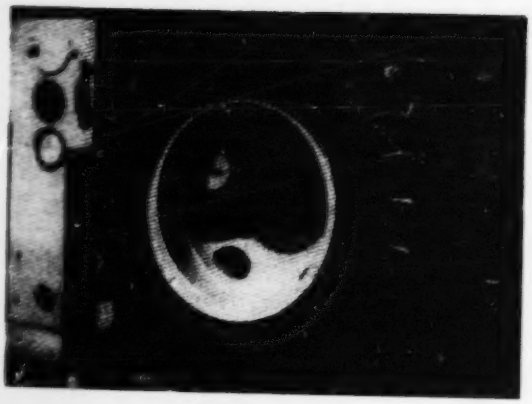
The Airborne is a lightweight portable shelter. The 4.6 x 5.2 m, 4.6 x 2.7 m, and 3.0 x 2.7 m Airbornes sleep ten, six, and three people, respectively. The hollow, shock-corded fiberglass poles provide structural support. The nylon cover is completely water and insect proof. This shelter has an integral floor and windows and doors with noseemum netting. It is quickly and easily assembled in the field. The Airborne fits into its own carrying bag. This shelter is used by the British Columbia Ministry of Forests, Yukon Forest Service, and National Defence. Contact Project Shelter Limited for additional information.

The Cascade

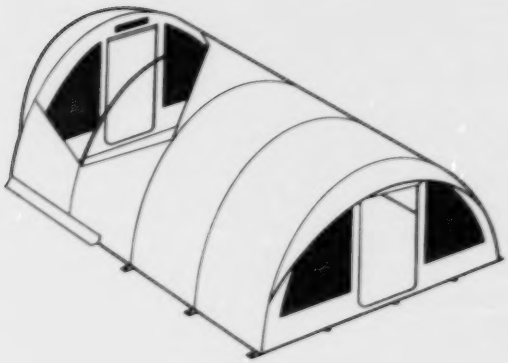
The 3.4 x 1.8 m Cascade shelter has two private and completely separate showers and dressing rooms. The frame consists of marine grade aluminum alloy poles. The vinyl-coated polyester cover is UV stable, and fire and cold resistant. The showers include a Paloma PH-12 propane-fired instant hot water heater, pre-assembled shower lines with quik-connect couplings, a custom-built Cascade heater box, and an interlocking grid flooring. A pressure-reducing valve with a built-in strainer permits the use of pumps that deliver pressures up to 23 kg/cm^2. The entire Cascade shelter weighs 120 kg. For additional information contact Project Shelter Limited.



Abrasion Machine

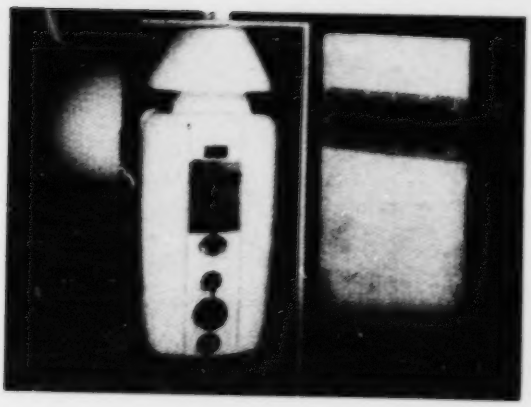


Spare Tire Carrier



The Airborne

The Airborne



The Cascade

The Cascade

The Pumpkin

The Pumpkin is a light weight, portable wilderness camp cabin. The vinyl-coated woven polyester cover is waterproof and rot, fire, and mildew resistant. The cover is velcro-fastened to the aluminum frame and appears in a standard desert sand colour. An optional insulating cover fits between the frame and outer cover. Four-91 x 91 cm screen windows have removable vue-flex and night flaps. One collapsible, aluminum-framed, hinged and latched door has a 28 x 43 cm window. Eight standard diametric (round) sizes range from 3.0 to 7.3 m in 0.6 m increments. Bunk beds, a wood burning stove, shelves, and tables are optional light weight furniture for the Pumpkin. The Alberta Forest Service reports that the 5.4-m Pumpkin is easily assembled. The Pumpkin was evaluated and approved for forest fire protection operations. Further information is available from Project Shelter Limited and Design Fabrication.

The Ranger

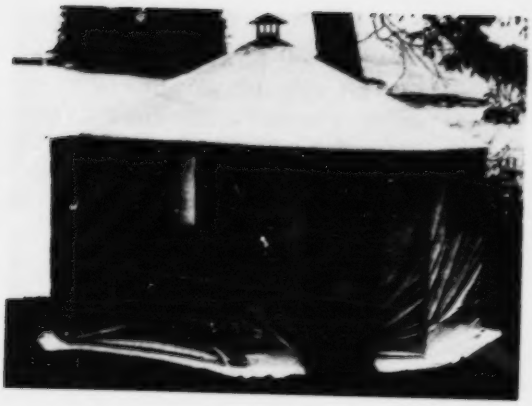
The vinyl-coated polyester drumtight cover of the Ranger is UV stable and fire and cold resistant. The lightweight frame consists of marine grade aluminum alloy poles. The Ranger includes a storm skirt, awnings, gable vents, seven windows, and a sliding door with noseeum netting. The uniform fittings and pole lengths are quickly and easily assembled. The British Columbia Ministry of Forests, Alberta Forest Service, and Parks Canada use the Ranger during forest firefighting operations. Contact Project Shelter Limited for additional information.

Bambi Bucket Improvement I

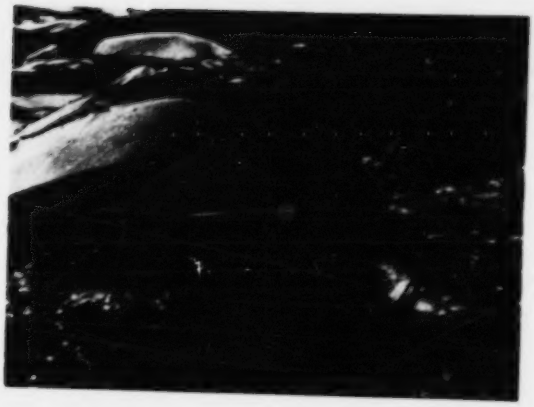
The Bambi Bucket control head trip-line release mechanism was redesigned by SEI Industries Limited. The new roller bearing trip mechanism reduces the work load on the solenoid. After 5000 consecutive dumps and fills, the new trip mechanism was well-conditioned. The retrofit kit costs about $150.00. SEI Industries Limited check and recondition Bambi Buckets.

Bambi Bucket Improvement II

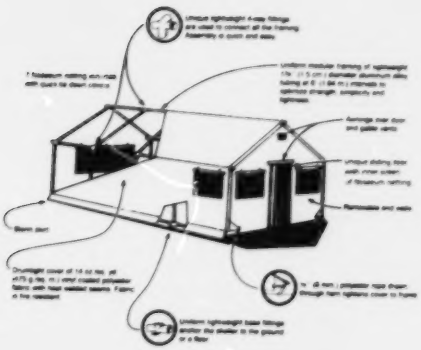
SEI Industries Limited developed the Instant Deployment System (IDS) for Bambi Buckets. The simple and reliable IDS eliminates setup time. The Bambi Bucket deploys as soon as the suspension cables grab its weight. The IDS is standard equipment for Bambi Buckets and is available in a retrofit kit. The retrofit kit costs about $300.00. SEI Industries Limited encourage further suggestions for Bambi Bucket improvements.



The Pumpkin

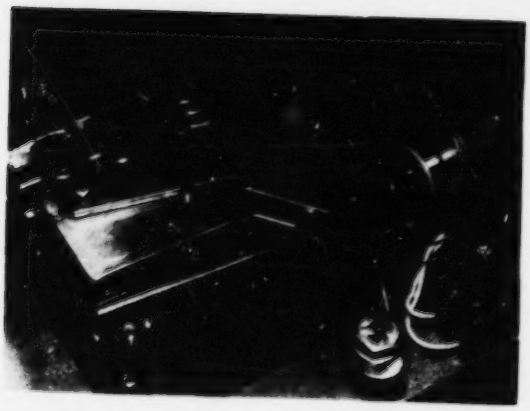


The Pumpkin



The Ranger

The Ranger



Bambi Bucket Improvement I

Bambi Bucket Improvement II

Simplex Helitorch System

The Simplex helitorch system includes control cables, an aluminum mixing paddle, an extra barrel, a spreader bar, and an augmented butane ignition system. It ignites forest slash and backfires on forest and range fires. The torch applies a jelly gas that gives a hotter, faster, and longer ignition with less fuel than the old diesel/gas mixture. This unit adapts to any helicopter that has a cargo hook and a 28-volt power supply. Contact Simplex Manufacturing Company for additional information.

Simplex Fire Attack System

The Simplex Fire Attack system is used for mop-up operations and lightning fire operations in remote areas. This system includes a Forest Service approved pump, a 500-L reservoir, 2.4 m of 38-mm suction hose, a suction strainer, 30 m of 25-mm hose, a lift harness, and a Forester fogstream nozzle. The Fire Attack system and additional 500-L reservoirs are ferried to the site by helicopter using a long line remote hook. The 30 m of 25-mm hose effectively covers a diameter of 104 m. For additional information contact Simplex Manufacturing Company.

Fuel/Gel Mixing System

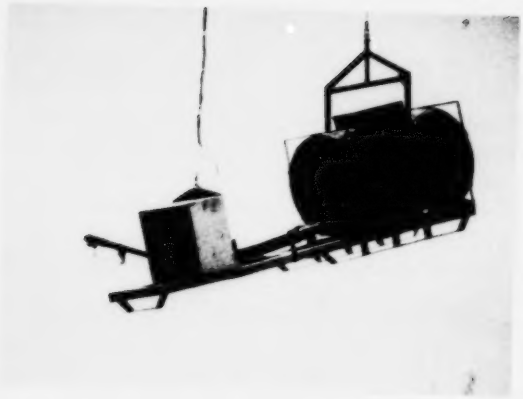
A fuel/gel mixing system is used in helitorch operations. The 1041-L mixing system frame is mounted onto a flatbed trailer. This system uses a 7-horsepower Honda engine and a Roger positive displacement pump. Cam-loc fittings safely transfer fuel/gel mixtures directly to the helitorch barrel. The fuel/gel mixing system costs $5590.00 US. Contact Simplex Manufacturing Company for additional information. (The Innovator, December 1985)

Portable Fire Pumps

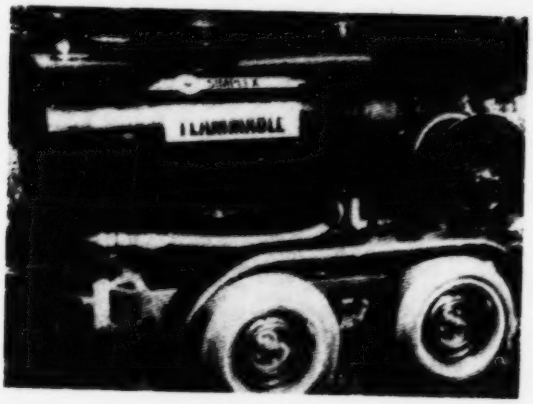
The Tohatsu portable fire pumps are compact, light (<100 kg), and efficient. The V75CS, V50CS, and V38BS models have a 2-cycle, 2-cylinder water-cooled gasoline engine and the V30AS, V20B, and V10D/C models have a 2-cycle, single vertical cylinder air-cooled gasoline engine. All models include flywheel magneto engine ignitions and a single-suction, single stage turbine pump with a four sliding vane type rotary vacuum pump. The fuel tank capacities range from 1.5 to 18 L and fuel consumptions range from 1.5 to 19 L/hr. The fuel gauges are easy to read. Regent Imports Pty. Limited distribute the Tohatsu pumps.

Valveless Handprimer

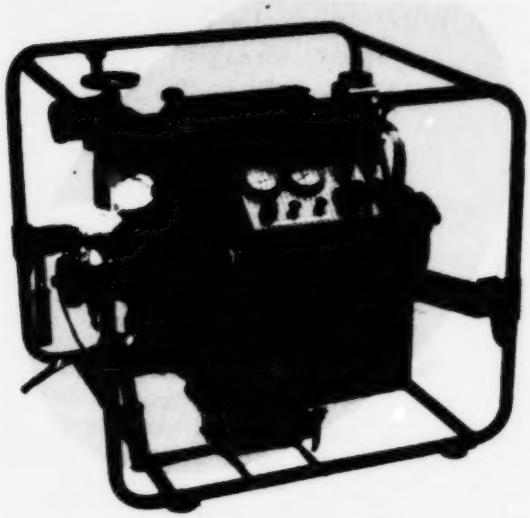
The San Dimas Equipment Development Center recommends the valveless handprimer for all Forest Service engines. This diaphragm-type primer system was designed by the USDA Forest Service, Region 1, Missoula, Montana. The handprimer is easily operated by moving the primer handle back and forth. This primer prevents possible operator injury because the valves do not remain open. It is a reliable component on fire engines that are used to suppress wildfires and manage prescribed burns. Contact Bud Clark for more information.



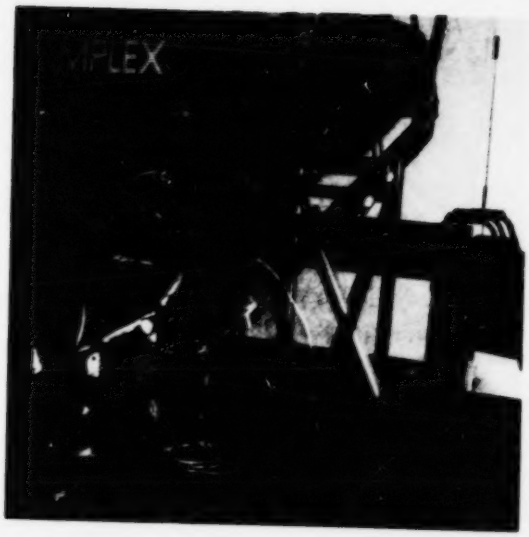
Simplex Helitorch System



Fuel/Gel Mixing System



Portable Fire Pumps



Simplex Helitorch System

Simplex Fire Attack System

Valveless Handprimer

Fire Fighters Field Pack

The fire fighters field pack was designed by the Missoula Equipment Development Center (MEDC) for the wild land fire fighter. The field pack includes a pack sack, harness, equipment belt, two canteen cases, and fire shelter. The pack sack, fire shelter, and canteen cases are constructed of a water-resistant, bright yellow Cordura nylon. The harness has padded shoulder straps and is available in male and female sizes. The equipment belt consists of a 60-mm wide heavy nylon webbing. Supplies are shifted between the pack sack and the equipment belt to facilitate activities on the fireline. The fire fighters field pack costs $50.00 US and is available from General Services Administration (GSA). For additional information refer to Equip Tips "Fire Fighters Field Pack" August 1984, USDA Forest Service, Missoula, Montana.

The 2.7 x 3.1 m Tent Fly

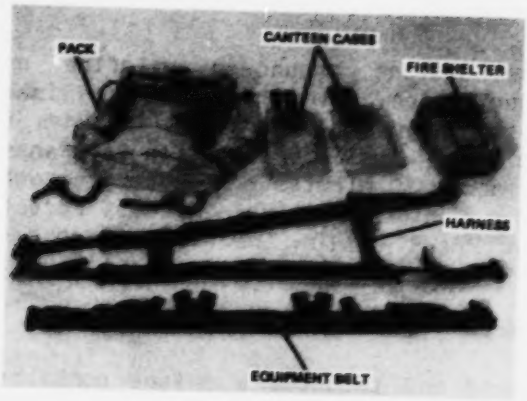
The Missoula Equipment Development Center (MEDC) designed a 60-g royal blue polyurethane-coated ripstop nylon tent fly. This 2.7 x 3.1 m fly provides material for a small tent and a ground cloth to protect sleeping bags from the elements. It weighs 1 kg and is used as a general purpose tarpaulin. The centre D-ring and corner/side grommets facilitate its construction. This tent fly costs $30.00 US. Refer to Equip Tips "Tent Flys" November 1984, USDA Forest Service, Missoula, Montana for additional information.

The Redesigned 4.9 x 7.3 m Tent Fly

The Missoula Equipment Development Center (MEDC) redesigned the 4.9 x 7.3 m tent fly. This 120-g bright yellow polyurethane-coated oxford nylon tent fly is stronger and lighter than the original vinyl tent fly. It has supportable polyester guy and eave lines with wooden tent slips to adjust line tension. It provides shelter and shade in open areas. This 7-kg tent fly is used as a general purpose tarpaulin. It costs $130.00 US. For additional information refer to Equip Tips "Tent Flys" November 1984, USDA Forest Service, Missoula, Montana.

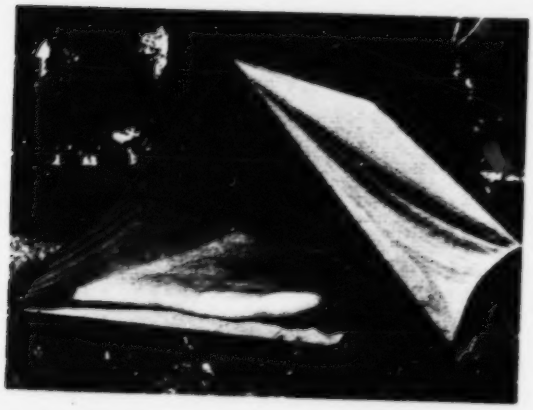
Fire Shelter

The fire shelter minimizes radiant heat and provides cool breathable air for lungs and airways during emergencies. The fibreglass cloth and aluminum foil with nontoxic, high temperature adhesive reflect 95 percent of radiant heat. The 15-cm wide perimeter skirt of the pup-tent fire shelter prevents smoke and heat from penetrating the shelter edges. Shelters are deployed in about 25 seconds in large cleared areas that minimize flame contact and smoke-producing fuels. New fire shelters are thoroughly inspected before fireline use. Refer to "Your Fire Shelter" Field Trial Copy August 1984, USDA Forest Service, Missoula, Montana for additional information.

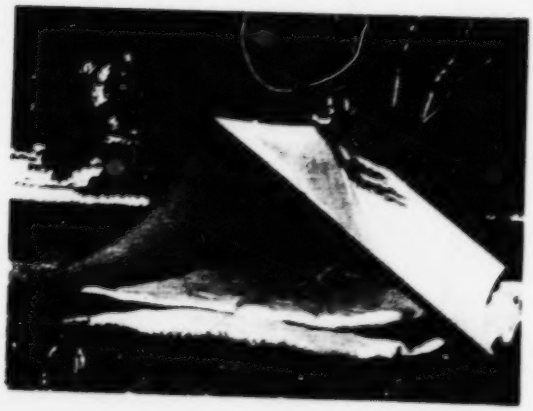


Fire Fighters Field Pack

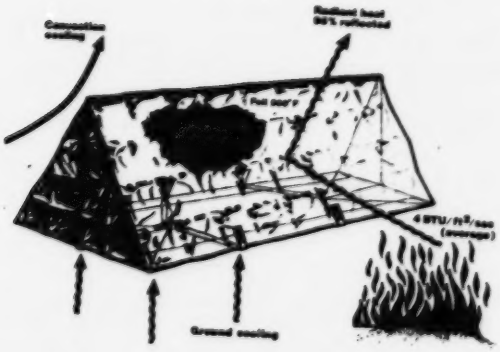
Fire Fighters Field Pack



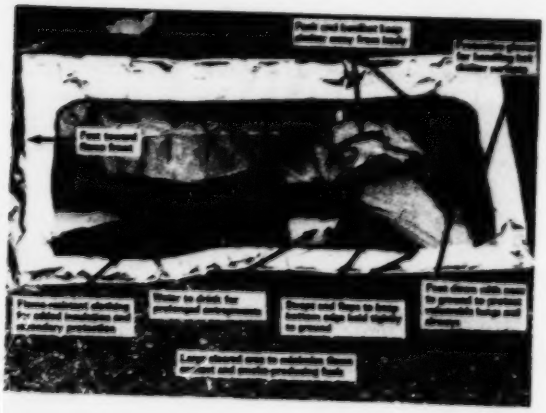
The 2.7 x 3.1 m Tent Fly



The Redesigned 4.9 x 7.3 m
Tent Fly



Fire Shelter



Fire Shelter

Portable Remote Automatic Weather Station (PRAWS)

The PRAWS monitors weather conditions around a wildfire or prescribed burn from the convenience of your office. Fire crews are mobilized when weather conditions are appropriate for burning. The PRAWS includes a data collection platform and a 1.5 - 1.8 m mast. The entire station is transported by helicopter and easily set up in about 30 minutes. Repeaters extend the transmitting distance of weather data. Contact John Warren, USDA Forest Service for further information about the PRAWS. (The Innovator, December 1985)

Zesto Therm Energy Pak, Sidekik, and Sofpak

Zesto Therm Incorporated developed and patented a unique portable energy source, Energy Pak, and two thermally insulated pouches, Sidekik and Sofpak. The 28-g, 13 x 15 x 0.6 cm Energy Pak is nontoxic, disposable, flameless, self-contained, compact, and lightweight. One Energy Pak heats 400 g of fresh, canned, freeze-dried, or boil-in-bag foods in 10 to 15 minutes after activation with 175 ml of water. They are disposable and a package of five costs $4.95 US. Foods are conveniently heated by the Energy Pak inside the Sidekik or Sofpak. The Sofpak and Sidekik have a teflon-coated vinyl lining, microfoam insulation, and a sturdy nylon outer fabric. The 285-g, 24 x 27 x 10 cm Sofpak costs $25.00 US. The 228-g, 23 x 22 x 5 cm Sidekik costs $25.00 US. Contact Zesto Therm Incorporated for additional information about Zesto Therm products.

Inexpensive Hose Bridge

An inexpensive hose bridge to protect charged hose on roads was developed by Joe King, Baker River Ranger District, Mt. Baker-Snoqualmie N.F. Discarded pieces of 38-mm CJRL hose are filled with sand and secured at both ends. The sand-filled hoses are fastened on both sides of the road hose with nylon straps. (The Innovator, December 1985)

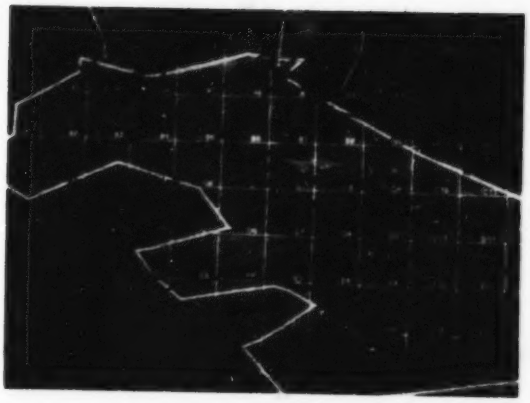
Communications Grid

A successful burn requires good communications. Communications are enhanced by photos and other visual aids. A simple straightforward grid is superimposed on a colour photograph of the burn site to improve communications to the pilot during helitorch operations. The burn boss directs the aircraft to the right place at the right time using the communications grid. The grid assists communications during surface ignitions. Contact Wes Hunter, Bureau of Land Management for additional information about the communications grid.

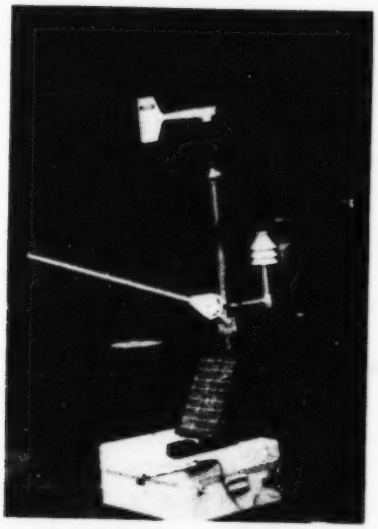
Salvaging 38-mm Brass Hose Coupling

The prototype threaded expansion segments were developed by Bill Neculeac and Keith Peterson, OMNR Thunder Bay Service Centre and were evaluated and tested by John Kiviste, PNFI. The threaded expander readily repairs moderately deformed 38-mm female threaded couplings.

Inexpensive Hose Bridge

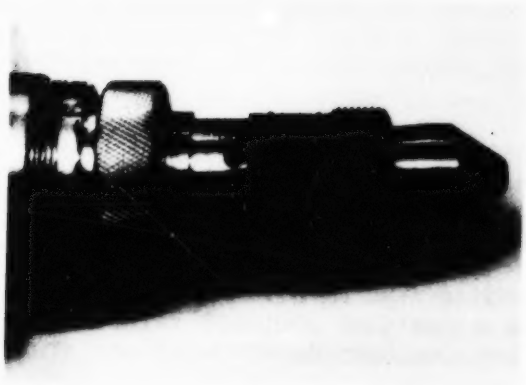


Communications Grid



PRAWS

Energy Pak, Sidekik, and Sofpak



Salvaging 38-mm Brass Hose Couplings

Salvaging 38-mm Brass Hose Couplings

The Fire Line

Doug Higgins and Gord Ramsey, PNFI will accept new items for Smoke Signals, Number Four.

The final report of Project #32, British Columbia Ministry of Forests concludes that the AGA 680, AGA 750, and Hughes Probeye 650 can detect hangover fires in landings. This 1976 report describes good test methods for accessing infrared detection devices.

The progress report of Project #42, British Columbia Ministry of Forests describes chain saw fire extinguisher tests. The Airguard, Firejet, Flame-Out, Flamex, Marshall, Mighty Midget, Record, Unival, and York are certified for use with power saws under the Forest Fire Regulations.

The progress report of Project #93, British Columbia Ministry of Forests describes standard evaluation tests for wet water agents. Test results indicate that Amway LOC, Bestline LC (improved), Multi-clean, Pyrosol, Sanfax 299, Satural, Teepol 610, and Thin-water are recommended and Bestline LC, Fire-Stop, Sulfon, and Fire Chem are acceptable.

The final report of Project #96, British Columbia Ministry of Forests describes an all-metal hose protector for road hose. A ramp is formed from lengths of 38-mm conduit pipe welded to the outer edge of lengths of 51-mm conduit pipe and attached at the bottom to opposite sides of a 21.6-cm expanded metal strip. This design provides a 10.2-cm protective gap for a 38-mm discharge hose.

The final report of Project #98, British Columbia Ministry of Forests describes a fire camp cookhouse trailer and includes specifications and drawings. This kitchen trailer is stocked with utensils and other food preparation equipment for 125-300 men.

The final report of Project #106, British Columbia Ministry of Forests describes an air to ground audio system for bird-dog aircraft. The power supply, audio amplifier, siren generator, and control head are discussed and schematic drawings are provided.

Project #128, British Columbia Ministry of Forests describes a fire camp shower that requires a reservoir, a pump, a water heating chamber, a burner, and shower heads. The self-contained portable shower provides bathing facilities for up to 16 persons per hour.

The final report of Project #133, British Columbia Ministry of Forests outlines improvements for fire mop-up operations. It recommends improved training techniques, high standards for hand tools, and the extensive use of infrared scanners and wetting agents.

Bernie Brouwer, Alberta Forest Service reports some improvements to their helitorch operation. They installed a positive shut-off valve and a wind deflector to their helitorches. They now use Surefire rather than Alumagel as a gelling agent.

The Northern Affairs Program requires current information about replacement hose bags for folded hose.

The Northern Affairs Program is seeking a reliable, light (<25 kg), inexpensive (<$800.00) replacement pump to pump dirty muskeg water for two or three fire seasons without requiring major repair work.

The Northern Affairs Program requires information about quick-connect couplings. The neoprene grooved gasket FA-12 is incompatible with quick-connect couplings.

The Northern Affairs Program found that Radio Shack's "pocket tone dialer" is an inexpensive alternative to an encoder microphone. The "pocket tone dialer" costs about $30.00.

The Northern Affairs Program tested a chemonics porta-tank. These porta-tanks are transported inside helicopters and easily assembled. The 1.8 x 1.8 x 1.2 m aluminum frame has a 4091-L capacity. A polyvinyl liner is hooked to the frame. The tank has a 51-mm discharge outlet. The chemonics porta-tank costs about $1850.00.

Wes Hunter, Bureau of Land Management suggests alternatives to broadcast burning, site preparation, and fuel manipulation. A clearwater yarder, linear water gel explosives, and alumagel filled plastic freezer bags create planting spots and rearrange or eliminate small slash fuels.

Hillco specializes in new farming methods and equipment. Hillco designed and engineered the Fire Goat. It is a self-leveling, hydrostatical propelled off-road vehicle that is specifically designed for severe terrain conditions. The Fire Goat raises and lowers its frame from 2.5 to 130 cm. It walks over logs and loads itself onto a flatbed trailer.

Kusawa Contracting Limited provides government agencies with fire crews, rappel crews, and smoke jumper crews. The smoke jumper and rappel initial attack systems are used for fire suppression in the Yukon Territory, Northwest Territories, Alberta, and British Columbia. The time from fire-call to take-off is five minutes when smoke jumpers are on red alert. Rappellers use a "continuous fibre" rope and a "sky genie" friction device to descend from a hovering helicopter to the immediate fire site.

The Automated Incident Management System (AIMS) and Grid Compass Computer System (GCCS) are used to transfer data, messages, and reports from fire camps to logistic sites. The BLM National Radio Support Cache has used the TI 765 terminals of the AIMS in fire camps for the past five fire seasons. The GCCS includes a portable microcomputer with 512 K memory, a 10 M hard disk with floppy disk drive, and an HP Ink Jet Printer. The GCCS transmits data via radio, satellite, and operates with voice capability. Allan Jeffrey, CIFFC, provides documentation and USA contact names for the AIMS and GCCS upon request.

Plastic bags filled with gelled gasoline utilize a ping pong ball incendiary device for ignition. The gelled gas method provides significant advantages over conventional methods for igniting forest fuels. Gelled gas is transported safely when ignition fuel is mixed with Surefire. Landings and accumulations are ignited safely from the ground using antifreeze injected ping pong balls. The gelled gas components cost $0.34/L of fuel, $0.07/plastic bag, $0.12/ping pong ball, and $0.21/L of surefire. The gelled gas lights slowly and does not soak into wood or evaporate. The gelled gas method costs about $52.00/landing and conventional methods cost about $76.00/landing. For further information contact H.H. Boydston, Canadian Forest Products Limited.

A COLLAPSIBLE 1365 l (300 GALLON) HELICOPTERABLE TANK

The collapsible 1365 L Helicopterable Tank provides for a supply of water on remote fires lacking a nearby available natural water source.

The highly visible orange coloured tank made from a tough, puncture resistant material comes with a 100 mm filtered inlet and a 38 mm outlet with shut off valve. It comes with a one foot ring for slinging under a Bell 212 or equivalent machine. Contact Fireflex Manufacturering Limited for further information.

THE STILWELL FIRE FLYER 500 l (110 GALLON) COLLAPSIBLE HELICOPTER TANK

The Stilwell Fire Flyer 500 L Collapsible Helicopter Tank is a larger version of the 270 l Stilwell Fire Flyer which is made of a tough, puncture resistant material (colour orange). It is equipped with a lift ring for slinging under a medium sized helicopter (i.e. Bell 205) and comes complete with 75 mm filler inlet and a 16 mm discharge with shut off valve. Greatest use is for mop-up on fires. For further information contact Stan Corter, Fireflex Manufacturing Limited.

Collapsible 1365 L Helicopterable Tank

Stilwell Fire Flyer 500 L

Contact the appropriate CCFFM forest fire equipment subcommittee member, fire management agency or product manufacturer for additional information about any item in this publication.

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Petawawa National Forestry Institute
Canadian Forestry Service
Agriculture Canada
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Fire Management Agency

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Contact: Wes Hunter
(Communications Grid, Broadcast Burning)
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141 Laurier Avenue, West
Ottawa, Ontario
K1A 0W6

Contact: Lloyd Swick
Tel: 613-993-6890

Forestry Commission of Tasmania
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Hobart, Tasmania

Contact: Brian Hodgson
(DAID Match, Fire Ball Cartridge, Electrical Ignition Device)
Tel: 30-3120
Telex: Tasfor AA 57204

Oregon State Forestry Department
Klamath-Lake District
3400 Greensprings Drive
Klamath Falls, Oregon 97601
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Contact: Dale Walker
(Spare Tire Carrier)
Tel: 503-883-5681

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Contact: Dick Rondeau
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Contact: Bud Clarke
(Valveless Handprimer)
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FTS: 8-584-4885

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Equipment Development Center
Building 1, Fort Missoula
Missoula, Montana 59801
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Contact: Ted Putnam
(Fire fighters Field Pack, Tent Flys, Fire Shelter)
Tel: 406-329-3929

USDA Forest Service
3905 Vista Avenue
Boise, Idaho 83705
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Contact: John Warren
(Portable Remote Automatic Weather Station)
Tel: 208-334-1439
FTS: 554-1439

Product Manufacturers

AGAtronics Limited
5230 South Service Road, Suite 125
Burlington, Ontario
L7L 5K2

Contact: Ron Newport
(AGA Thermovision 782, AGA Thermopoint 80)
Tel: 416-637-5696
Telex: 061-8709

Bayly Engineering Limited
167 Hunt Street
Ajax, Ontario
L1S 1P3

(Fire Control Monitor)
Tel: 416-683-8200

Canadian Forest Products Limited
2800-1055 Dunsmuir Street
P.O. Box 49420
Vancouver, British Columbia
V7X 1B5

Contact: Oliver Thomae
(Elevated Sprinkler Design, Suzuki 185 Lt Quadrunner)
Tel: 604-661-5241
Telex: 04-53338/Cable Canfor

Canadian Forestry Equipment Limited
1435 Tees Street
St. Laurent
Montreal, Québec
H4R 2A7

(Hose Strangler Holster Assessment Pin)
Tel: 514-685-1100

Coast Crane Body and Equipment Company
410 N.E. Columbus Blvd.
Portland, Oregon 97211
U.S.A.

(Versa-Ramp)
Tel: 503-288-9177

Coghlan's Limited
12 Irene Street
Winnipeg, Manitoba
R3T 4C7

(Can Opener)
Tel: 204-284-9550
Telex: 0757542

Design Fabrication
P.O. Box 1445, Station B
Mississauga, Ontario
L4Y 4G2

Contact: John Matchung
(The Pumpkin)
Tel: 416-275-5586

Dundas-Jafine Industries Limited
5777 Steeles Avenue, West
Toronto, Ontario
M9L 2W3

(Ductape Adhesive)
Tel: 416-745-4100

Fireflex Manufacturing Limited
204 - 20628 Mufford Crescent
R.R. #4
Langley, British Columbia
V3A 4P7

Contact: Stan D. Carter
(Rap-A-Tent, Flex-Pak Backtank, Quonset-Shaped Tent, Self-Supporting Collapsible Water Tanks), Collapsible 1365 L Helicopterable Tank, Stilwell Fire Flyer 500 L)
Tel: 604-533-4268

Hillco
107 F Avenue
P.O. Box 399
Nezperce, Idaho 83543
U.S.A.

Contact: Wallace L. Hill or Lenny Hill
(Fire Goat)
Tel: 208-937-2461

Kusawa Contracting Limited
P.O. Box 421, Station A
Vancouver, British Columbia
V6C 2N2

Contact: Paul Thompson or Harley Gifford
(Smoke Jumper and Rappel Initial Attack Systems)
Tel: 604-734-5985

Leesnurm Engineering
625-2660 Norberry Crescent
Ottawa, Ontario
K1V 6N2

Contact: T. Leesnurm
(Flexible House)
Tel: 613-523-2911

Levitt-Safety Limited
33 Laird Drive
Toronto, Ontario
M4G 3S9

(Headset Communication System)
Tel: 416-425-8700
Telex: 06-22286

Niedner Limited/Limitée
P.O. Box/Case Postale 20
Coaticook, Québec
J1A 2S8

Contact: David Lord
(Abrasion Machine)
Tel: 819-849-2751

Project Shelter Limited
14 West, 5th Avenue
Vancouver, British Columbia
V5Y 1H5

Contact: Peter Banfield
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Tel: 604-876-2191
Telex: 04-54654

SEI Industries Limited
407-5940, #6 Road
Richmond, British Columbia
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Contact: Ken Nielsen
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Telex: 04-355779

Simplex Manufacturing Company
13340 N.E. Whitaker Way
Portland, Oregon 97230
U.S.A.

Contact: Dan Conti
(Simplex Helitorch System, Simplex Fire Attack, Fuel/Gel Mixing System)
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Telex: 360-936

Tohatsu Corporation
c/o Regent Imports Pty. Limited
124 Bank Street, South
Melb. 3205

(Portable Fire Pumps)
Tel: 699-2018
Cables: REGIMP MELB.

Zesto Therm Incorporated
10274 Alliance Road
Cincinnati, Ohio 45242
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J.D. Irving Woodlands Division
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Fredericton, New Brunswkci
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5. Personal Gear Pack
6. Hose Strangler Modification
7. Ontario Sprinkler System
8. Inexpensive Fire Finder for Lookout Towers
9. Econoflo Hose Roller
10. Minitron Electronic Ignition Modules for Wajax MK3 Pumps
11. Pump Primer and Check Valve
12. Ontario Mechanical Hose Washers
13. National Standard Quick Connect Hose Coupling
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19. Lightweight Power Pump Kit
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22. Resleeving Wajax Mark 3 Cylinders
23. Okanagan Helicopter Flying Drip Torch
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35. Bambi Bucket for Helicopters
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5. Radio Telephone
6. Styrofoam Float for Fire Pump Intake Hoses
7. The Stilwell Fire Flyer Collapsible Helicopter Tank
8. Nylon Water Bag Test Attachment
9. Save $$ on Wetting Agents
10. Thermovision DC-DC Converter
11. PT-500 Radio Adapter
12. Pump Head Filter
13. Banner Guard Continuous Message Tape
14. Circuit Breaker for Mark II PFRC Aid Dispenser
15. Hose Drying Ramp Cover
16. Mobile Arm for Loading Fuels
17. An Improved Sprinkler System
18. B.C. Tests Small Portable Pumps
19. Portable Fireline Pump Tester
20. National Standard 38 mm External Lug Forestry Couplings
21. Hose Marking Device
22. Unitized Portable Reservoir Systems
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25. Wajax Mark 3 Electronic Ignition Modules
26. Computer Battery Back Up
27. Chain Saw Kit Packboard
28. Water Thief Modification
29. Premo MKIII Aerial Ignition Device
30. Steaming Machine
31. Pump of the Month - The Fairbanks - Morse
32. Parts Washer
33. Cartage Tanks for Use on Twin Otter Aircraft
34. Bambi Bucket Evaluated in Nova Scotia
35. Helicopter Belly Plug for Use With Simplex Helitorch
36. Promising Forest Fire Fighting Foam
37. Water Intensifier for Conventional Helibuckets
38. Days Gone By
39. Electric Winch for Hose Drying Tower
40. Mini Hose Dryer
41. FTS 6100 Fire Weather Station and Telemetry Package
42. Improved Simplex Helitorch Igniter System,
43. A Collapsible 1365 Litre Relay Tank System
44. Portable Tests for Fire Pumps and Outboard Motors
45. Armadillo Shaped Tent Being Evaluated in B.C.
46. Photovoltaic Power Systems in Use by Yukon Forest Service